MODULE VI - GROUNDWATER CORRECTIVE ACTION

VI.A. CORRECTIVE ACTION PROGRAM

The Permittee shall maintain the ongoing corrective action program. The purpose of this program shall be to remove hazardous constituents from the groundwater and to monitor the migration of the hazardous constituents as outlined in Module V. The corrective action program shall follow the plan specified below:

VI.A.1. The Permittee shall maintain a groundwater treatment system. The system shall treat and remove the volatile organic hazardous constituents listed in Condition V.B.1.a. from the groundwater. The system shall inject the treated groundwater into the impacted aquifer.

VI.A.2. The Permittee shall sample the groundwater in the impacted aquifer, the groundwater as it enters and exits the groundwater treatment units, and measure the volume and rate of flow of groundwater through the groundwater treatment system as indicated in Module V of this permit.

VI.A.3. The Permittee shall submit for the approval of the Executive Secretary, a plan describing additional measures that may be used to enhance the removal of the hazardous constituents specified in Condition V.B.1.a. from the groundwater. This plan shall be submitted on or before October 15, 2001, and every three years thereafter. This plan shall consider several options for additional measures such as pulsed pumping, installation of extraction wells in hydrodynamically isolated areas, and additional characterization and modeling of contaminant transport in the fractured bedrock, or other impacted areas. The Permittee shall implement the additional measures within 90 days after approval of the measures by the Executive Secretary.

VI.A.4. In accordance with section VI.A.3. the Permittee has submitted and received approval from the Executive Secretary to implement an alternative measures evaluation of the ground water treatment system, as described in the "*Final Project Work Plan, Implementation of Alternative Measures, Industrial Waste Lagoon, dated May 2003"* (ref: attachment 4, section H.1.). This evaluation will be implemented following the Spring 2004 ground water sampling event and continue for up to three years. During this evaluation period, the existing pump and treat system will be maintained in a non-operational mode, along with sampling and analysis, and data reporting as described in the *"Final System Non-operation Test Proposal, Implementation of Alternative Measures, dated October 2003"* (ref: attachment 4, section H.2). Prior to implementation of the Alternative Measures Evaluation, the Permittee shall submit for the approval of the Executive Secretary, a Sampling and Analysis Plan, Site Safety and Health Plan, Staffing Plan, Inspection Schedule, and Contingency Plan that will be implemented during the three year evaluation. These plans, once approved by the Executive Secretary, will supercede other such requirements of this permit during the evaluation period.

VI.B. DESIGN AND EFFECTIVENESS OF THE GROUNDWATER TREATMENT SYSTEM

VI.B.1. The Permittee shall provide a summary of the effectiveness of the groundwater treatment system in each semi-annual report as indicated by Condition V.F.1, and listed in Table V-4.

VI.B.2. The Permittee shall maintain a system to prevent well plugging and to prevent particulate matter in the groundwater from plugging the air stripper and the injection wells.

VI.C. GROUNDWATER TREATMENT SYSTEM

VI.C.1. The Permittee shall maintain a groundwater treatment system that consists of the following elements:

VI.C.1.a. The Permittee shall maintain and install, if required, an adequate number of groundwater extraction wells and groundwater injection wells to contain, capture and treat the contaminant plume.

VI.C.1.b. The Permittee may, based on the results of the Condition VI.A.3. make modifications to the treatment system that will facilitate the acceleration of the cleanup. Significant modifications to the system, as classified in accordance with R315-3-4.3 must be approved by the Executive Secretary.

VI.C.1.c. The Permittee shall maintain a system to monitor the groundwater treatment units. This monitoring system shall be automated and shall be capable of system shutdown in the event of a malfunction that could impair the performance of the system or threaten human health and the environment.

VI.C.1.d. The Permittee shall operate an automatic alarm notification system. This system shall notify the appropriate personnel specified in the Contingency Plan, in the event that the system shuts down or requires attention.

VI.C.3. The Permittee shall maintain an inspection schedule for the inspection of all parts of the groundwater treatment system as outlined in Attachment 1. Any modification to the schedule shall be approved by the Executive Secretary.

VI.D. TREATMENT OF HAZARDOUS CONSTITUENTS

The Permittee shall operate a treatment system that will treat the contaminated plume of groundwater to the concentration levels listed in Table V-2.

VI.D.1. The treatment system shall be designed to manage the flow of contaminated groundwater to ensure containment of the plume.

VI.D.2. If the Executive Secretary receives information demonstrating that the treatment system is not removing the volatile organic hazardous constituents to the levels specified in Condition VI.D above, the Permittee shall initiate a permit modification request to install additional treatment processes (e.g. carbon adsorption) to treat the groundwater to meet the requirements of Condition VI.D.

VI.E. WELL LOCATION INSTALLATION AND CONSTRUCTION

The Permittee shall maintain groundwater extraction wells and groundwater injection wells as a part of the groundwater treatment system as specified below:

VI.E.1. The construction of additional extraction wells or injection wells shall follow the techniques described in the Technical Enforcement Guidance Document (TEGD), OSWER-9950.1, September 1986 and subsequent addenda. If techniques other than those described in the TEGD are used, the techniques must be approved by the Executive Secretary prior to installation of the extraction and injection wells.

VI.E.2. The Permittee shall maintain the extraction and injection wells at the locations shown in Attachment 1, Figure 1. The closure, abandonment, or installation of new extraction or injection wells shall follow the modification procedures of Condition I.D.

VI.E.3. In areas within the groundwater contaminant plume, the Permittee may generate groundwater contaminated with hazardous constituents from the following processes: 1) development of newly constructed piezometers, monitoring wells, extraction wells, and injection wells; 2) sampling of monitoring wells; and 3) water generated from the treatment units and piping pursuant to Condition VI.F.8. Disposal of water generated from the processes listed above shall be as follows:

VI.E.3.a Groundwater contaminated with the hazardous constituents listed in Table V-2 of Module V may be disposed of through the groundwater treatment system.

VI.E.4. Upon approval by the Executive Secretary, additional extraction and injection wells shall be installed to maintain plume capture compliance, as indicated by the annual groundwater model recalibration (reported in Table V-3). Such changes may include, but are not limited to, groundwater level elevation, direction of groundwater flow, and changes in the concentrations of hazardous constituents in the groundwater.

VI.E.5. Upon approval by the Executive Secretary, additional extraction wells or injection wells shall be added to the system if either the annual groundwater model recalibration, Volume II, Attachment 3, or the groundwater monitoring program outlined in Module V indicates that extraction wells or injection wells in places other than those specified in Volume II, Attachment 1 will enhance the removal of hazardous constituents from the impacted aquifer.

VI.E.6. If hazardous waste constituents exceeding the groundwater protection standard concentration limits as defined in Condition VI.D., are detected in hydraulically

downgradient monitoring wells, the Permittee shall install additional extraction and injection wells further downgradient. A work plan addressing plume capture compliance shall be submitted for approval by the Executive Secretary within 60 days of discovery.

VI.E.7. The Permittee may be required to install additional extraction and injection wells at any time during the post-closure or compliance periods if new information or unforeseen circumstances reveal a need for additional removal of contaminated groundwater to protect human health and the environment. Installation of new extraction and/or injection wells shall constitute a permit modification under the terms of this permit and shall be initiated as specified in Condition I.D.

VI.E.8. Within 90 days of completion of wells installed after permit issuance, the Permittee shall submit extraction and injection well completion reports. These reports shall include, but not limited to boring logs, sieve analysis (grain size), standard penetration tests, analytical tests performed on soils, water level elevations, groundwater contour maps, well development results including recharge rates, pump or slug test, cross sections or fence diagrams, as well as all other pertinent data.

VI.E.9. All extraction and injection wells shall be maintained in a fully operational condition for the duration of this permit. The Permittee shall notify the Executive Secretary in writing within seven days when a well is no longer found to be operable or when the Permittee intends to abandon one or more wells associated with groundwater treatment system. The Executive Secretary must approve the conditions for replacement or correction of improperly operating wells.

VI.E.10. The Permittee shall receive the approval of the Executive Secretary in order to permanently remove extraction wells or injection wells from the groundwater treatment system. All extraction and injection wells deleted from the groundwater treatment system shall be plugged and abandoned in accordance with procedures that will be submitted to and approved by the Executive Secretary. Well plugging and abandonment methods shall be submitted to the Executive Secretary and follow modification procedures as stated in Condition I.D.

VI.F. OPERATION OF THE GROUNDWATER TREATMENT SYSTEM

VI.F.1. The Permittee shall maintain and operate the groundwater treatment system as specified in this permit.

VI.F.2. The Permittee shall operate the groundwater treatment system in a manner that will prevent spills, releases, or other adverse affects to human health and the environment and as specified by Conditions VI.C.1.c. and d.

VI.F.3. The Permittee shall monitor the effects of the groundwater treatment system as specified in Condition V.D.4.a. and b., and if the groundwater in any off-depot well(s) is affected, the Permittee shall notify the Executive Secretary within seven days, as specified in Condition I.L., Table I-2.

VI.F.4. The Permittee shall train all personnel operating the groundwater treatment system as outlined in Condition II.C.

VI.F.5. The Permittee shall maintain a Preventative Maintenance Schedule as part of the Contingency Plan as part of Attachment 6. This maintenance schedule shall include all parts of the groundwater treatment system as specified in Condition VI.C.1.b, c, and d, and any other parts of the system not specified above, as provided in Attachment 1.

VI.F.6. The Permittee shall annually recalibrate the groundwater flow model and the groundwater solute transport model. A report describing annual model recalibration shall be submitted as required in Condition V.F.1, and reported as listed in Table V-4. An abstract of each year's modeling efforts will be included in Attachment 3.

VI.F.7. The Permittee shall take any action necessary to maintain the groundwater treatment system as indicated by annual recalibration of the groundwater flow model and the groundwater solute transport model.

VI.F.8. The Permittee shall not allow contaminated groundwater to remain in the groundwater treatment units or the piping leading from the extraction wells to the groundwater treatment units for a period exceeding 90 days. The Permittee will remove the contaminated groundwater prior to the end of the 90-day period and dispose of the groundwater as indicated in Condition VI.E.3.a.

VI.F.9. If the groundwater treatment unit is inactive due to a mechanical failure, or due to a power loss, then the Permittee shall implement the Contingency Plan, Attachment 6, specified in Condition II.E.2.

VI.G. INSPECTION AND DOCUMENTATION FREQUENCY

VI.G.1. In order to prevent the release of hazardous wastes from the treatment system, the Permittee will operate, maintain, and inspect the system in accordance with R315-8-10, as well as Table VI-1 and VI-2 of this permit.

VI.G.1.a. Hazardous wastes may not be placed in the system if they could cause the system to rupture, leak, corrode, or otherwise fail.

VI.G.1.b. The Permittee shall maintain the use of appropriate controls and practices to prevent releases from the system.

VI.G.1.c. The Permittee shall maintain an inspection program and schedule intended to prevent the release of hazardous wastes from the system. Inspections shall be conducted on the components of the system, as specified in Table VI-1 and VI-2 of this permit.

VI.G.1.d. If, during inspections required under Condition VI.G.1.c., the release or potential release of a hazardous waste is identified, the component of the system will be taken out of

service immediately. If failure of the component has resulted in a release of hazardous waste, the Contingency Plan (Attachment 6) will be immediately implemented.

VI. H. CLOSURE OF GROUNDWATER TREATMENT SYSTEM

VI.H.1. Upon completion of the groundwater corrective action program required under Condition VI.A., the groundwater treatment system will be decommissioned in accordance with UAC R315-8-7.

VI.H.2. Decontamination of process areas, floors, walls, internal structures and equipment will be accomplished using a combination of high-pressure water and steam cleaning. Wipe samples shall be collected and analyzed to determine when decontamination is complete. All liquids generated from this process shall be collected into tanks or other approved containers. The collected liquids shall be disposed of off-site at an approved hazardous waste disposal facility.

VI.H.3. Exterior site areas (e.g., equipment staging areas, runoff accumulation areas, roadways and random soil surfaces) shall be sampled to ensure that they have not been contaminated. Any locations where contamination is discovered shall be characterized fully, and corrective action shall be taken if necessary.

VI.H.4. Prior to initiation of closure activities, notification to the Executive Secretary of the Permittee's intent to close the facility will be made. This notification will include a revised closure plan with necessary changes proposed, including decontamination standards, sampling protocols, and a detailed schedule for closure activities. Approval of the revised plan by the Executive Secretary will be required prior to starting closure activities. The closure procedures shall include, but not necessarily be limited to the following activities for each type of process equipment:

VI.H.4.a. Tanks The interior and exterior of tanks shall be rinsed with high-pressure water or steam as required to remove residual contamination. Wipe samples shall be collected from the interior and exterior of the tanks to determine if decontamination is complete. If standards are not met, additional rinsing will be conducted until wipe samples demonstrate successful decontamination.

VI.H.4.b. Process Pumps, Piping and Ancillary Equipment All process pumps, piping, and ancillary equipment shall be disconnected and isolated to allow for cleaning. The interior and exterior or each component shall be rinsed with high-pressure water or steam to remove residual contamination. Wipe samples shall be collected from the interior and exterior of each component to determine if decontamination is complete. If standards are not met, additional rinsing will be conducted until wipe samples demonstrate successful decontamination.

VI.H.4.c. Process Areas, Floors, and Interior Walls shall be pressure-washed or steam-cleaned as necessary. Wipe samples shall be collected from cleaned surfaces and analyzed to determined if decontamination is complete.

VI.H.5. In some cases, adequate decontamination of surfaces may not be possible. Consequently, such items shall be considered hazardous waste and managed as such.

VI.H.6. Exterior site areas where known or potential releases may have occurred shall be sampled for residual contamination. If contamination is detected, further characterization and corrective action shall be initiated in accordance with Module VII.

VI.I. DURATION OF CORRECTIVE ACTION PROGRAM

The Permittee shall continue to treat the groundwater until such time as the Groundwater Protection Standard (as specified in Condition V.C.4.) has been met. Following written notification to the Executive Secretary that the standard has been met, the Permittee may discontinue treatment but shall continue to monitor the groundwater (as specified in Module V) to determine if the concentration of the hazardous constituents listed in Table V-2 have been met for three consecutive years.

VI.J. EXIT STRATEGY

RESERVED FOR DEVELOPMENT AT A LATER DATE

VI.K. INTERIM CORRECTIVE MEASURES

The Permittee shall implement as an interim corrective measure, a plan to mitigate potential risks to off-site receptors of ground water contamination on portions of the Solid Waste Management Unit 58 ground water plume, located off-site underlying privately owned property. This interim corrective measure will be maintained until such time that the RCRA Facility Investigation and Corrective Measures Study for Solid Waste Management Unit 58 have been completed, and the final corrective measures are implemented. The interim corrective measures will be implemented as described in the *"Groundwater Management Area Plan, Northeast Boundary Plume"* (ref: attachment 4, section C.1.). A map showing the location of the Northeast Boundary Plume, Groundwater Management Area is provided in Attachment 8 of this permit.

Table VI-1
Groundwater Treatment System
Preventative Maintenance Inspection Schedule

Inspection Requirements	Frequency
Stripper Feed Pumps Pump On-line Switch Position Run Hours Mechanical Seals Valves and Associated Piping Fan Temperature Rotor Assembly Temperature Shaft Temperature Drive Bearing Temperature Non-drive Bearing Temperature	Daily
Hydropnuematic System (In-plant Water) Pressure Operation (Abnormal Noise or Vibration) Water Reservoir Level	Daily
Containment Basins/Sump Pumps/Valves and Piping Visual Check (Flooding) Surge Tank and Stripping Tower Valves and Piping Excessive Debris Freezing (Winter)	Daily
Plant Alarm System Dry Contact Operation Auto Dialer Operation Emergency Lighting	Daily
Stripper Blowers Blower On-line Switch Position Run Hours Filters, Belts, Bearings Operation (Abnormal Noise or Vibration) Intake Filters Beltside Bearing Temperature Blowerside Bearing Temperature	Daily
Stripper Blowers Belts (Wear/Tension)	Weekly
Stripper Feed Pumps Vibration	Weekly

Inspection Requirements	Frequency
Stripper Feed Pumps Pump Cooling Return Line Water Flush to Seal Bearing Lubrication	Monthly
Stripper Blowers Off-line Blower Check Belt Tension/Wear/Alignment Motor Temperature (Windings, In-board/Out-board) Bearing Lubrication	Monthly
Extraction Well Variable Frequency Drives (VFDs) Operation (Abnormal Noise and Vibration) Air Conditioning Filters Condensation Run Hours	Monthly
Electrical Checks (AC Amps) and Run Hours Blowers Feed Pumps Extraction Wells	Monthly
Stripping Towers Internal Conditions and Packing	Annual

Table VI-2
Groundwater Treatment System
Safety Checklist

Treatment Facility	
Emergency Shower / Eye Wash Safety Signs Fire Extinguishers Facility Piping and Valves Emergency Lighting Flammable Storage Containers (Sealed and Labeled) Rag Storage House-keeping Equipment Ladders Aisles and Walkways Exits Equipment Being Repaired (Lock-out/Tag-out) Pump and Equipment Areas First Aid Kits Fire Alarm Spill Kit	Weekly
Outside Treatment Facility - Containment Areas and Grounds	
Ladders and Safety Cages Manways, Flanges, Valves, and Piping Containment Areas Sumps Safety Signs Aisles and Walkways Exits Pumps and/or Equipment	Weekly
Outside Treatment Facility - Containment Areas and Grounds	
Air Stripper Containment Area G.F.C.I Tested	Monthly